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(54) MOUNTING FRAMES FOR CARPET TILES

(71) I, JOSEPH LEJZOR KANTOROWICZ, of 15, Habsburgstrasse, 5200 Windisch, Switzerland, an Israeli citizen do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to mounting frames for carpet tiles.

It is known to provide floors, walls and also the ceilings of rooms with coverings for which purpose various materials of various qualities, colours, shapes, and so on are used. Particularly because of their ease of handling and the large choice of colours, qualities, and patterns and because of their sound absorbing properties, preferred materials are pieces or carpeting, textiles, felt and soft plastics.

According to the invention there is provided a mounting frame for carpet tiles, comprising a base plate, rectilinear side walls having greater internal depth than the thickness of the base plate and framing the base plate to define therewith a carpet receiving space, fastening means associated with each side wall adapted to detachably fasten that side wall to an adjoining side wall of a juxtaposed mounting frame, and retaining means arranged to retain a carpet tile in the carpet receiving space.

Preferably the base plate and the side walls are made in one piece and may suitably be made of plastics material.

Preferably, the retaining means comprise portions of the side walls projecting laterally over the carpet receiving space.

Preferably, each side wall is formed with a socket and the fastening means comprises a pin integral with said side wall, the pins and sockets being so arranged that adjacent side walls of juxtaposed mounting frames may be detachably fastened together by at least two pin and socket connections.

Alternatively, each side wall is adapted to receive a bolt comprising the fastening means, whereby adjacent side walls of juxtaposed mounting frames may be detachably fastened together by at least two bolted connections.

Pins and sockets or bolt receiving apertures and threaded sockets may be alternately disposed around the periphery of the frame.

The inner sides of the side walls may be inclined in such a manner that the upper surface of the base plate enclosed by the side walls is larger in area than the area enclosed by the top edges of the side walls.

The fastening means for detachable fastening may comprise at least one fastening element adapted for insertion in an associated recess of its respective side wall. The recess may be formed by a channel in the upper edge and the inner side of the side wall which extends into the adjoining base plate. A projecting pin may extend from that portion of the channel formed in the base plate, the pin being adapted for securing the fastening element and having a top surface which is flush with the upper surface of the base plate.

Alternatively, the recess may be in the form of a notch extending parallel to the joint between the base plate and the inner side of the side wall, a blind hole or an open ended bore. Further the recess may be in the form of a groove which is disposed on the outer side of the side wall and extends in the longitudinal direction of the side wall, the cross-section of the recess being narrower at its outer aperture than at portions of the recess which are below the outer surface.

Preferably, the retaining means comprise portions of the connecting element adapted to retain a carpet in the carpet receiving space.

The underside of the base plate may be provided with an anti-slip surface which may comprise a non-slip coating adhering to the underside of the base plate. Alternatively the anti-

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slip surface may be provided by roughening the underside of the base plate.

At least one of the side walls may have, at the height of the upper surface of the base plate and over its entire length, a slot for the insertion of a covering or of an intermediate material to be inserted.

The invention also includes a surface covering made up of mounting frames as above described.

Several embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:—

15 Fig. 1 is a plan view of one form of construction of a mounting frame according to the invention, in which the side walls and fastening elements are shown on a larger scale in relation to the overall dimensions, for the sake of greater clarity;

20 Fig. 2 is a section through the mounting frame illustrated in Fig. 1, taken along the line II—II;

25 Fig. 3 shows, on a much larger scale, a section of the adjoining side surfaces of two juxtaposed mounting frames of the type illustrated in Figs. 1 and 2, and illustrates the co-operation of the connecting elements;

30 Fig. 4 is a plan view of a number of juxtaposed mounting frames;

Fig. 5 shows, in perspective, part of a surface covering assembled from mounting frames according to another embodiment of the invention;

35 Fig. 6 is a sectional view taken on the line A—A of Fig. 5 showing two juxtaposed mounting frames fastened together by a connecting element;

40 Fig. 7 is a perspective view of part of a mounting frame on the side wall of which there is disposed an edge member forming the outer termination of the surface covering; and

45 Figs. 8 to 12 show sections through still further forms of construction of two juxtaposed mounting frames fastened to one another by a connecting element.

The mounting frame illustrated in Figs. 1 and 2 has a square base plate 10 and four side walls 11, 12, 13, and 14. The outer side of each of the side walls extends upwards at right-angles from the base plate, while its inner wall is inclined in such a manner that the area of the mounting frame enclosed on the upper side of the base plate is larger than the area enclosed by the top inner edges of the side walls (Fig. 2). Each of the side walls has two fastening elements 15, 16 or 17, 18 or 19, 20 or 21, 22, which subdivide the side surface into three portions of equal length in its longitudinal direction and which are disposed halfway up the height of the side walls. The fastening elements consist of holes 16, 18, 20, and 22 and of pins 15, 17, 19, and 21 projecting at right-angles from the side wall and provided at their front end with a spherical thick-

ened portion. At the height of the upper side of the base plate, a slot 23 is also provided in the side wall 13. The four outer edges are provided with notches 25, 26, 27, and 28 which extend parallel to the base plate and which are disposed halfway up the height of the side wall, their width corresponding to the diameter of the holes. The underside 29 of the base plate is roughened by a pattern of inter-crossing notches similar to a file.

The outer side length of the mounting frame illustrated is 30.4 cm and the width of the side walls and their top end is 0.2 cm, so that the free area enclosed by the side walls is suitable for the insertion of square pieces having a side length of 30 cm. The inclination of the inner sides of the side walls is so selected that at their bottom end they have a minimum width of 0.17 cm. The thickness of the base plate amounts to 0.1 cm and the total height of the side walls from the bottom to the top edge amounts to 0.9 cm. The diameter of the hole provided as fastening element and the width of the notches provided at the edges amounts to 0.25 cm, while the diameter of the cylindrical portion of the projecting pin amounts to 0.28 cm and the diameter of the spherical thickening provided at the end of the pin is 0.33 cm. The overall length of the pin amounts to 0.3 cm. The slot at the bottom end of one side wall has a width of 0.15 cm. The mounting frame described is made of plastics material and produced in one piece by the injection moulding method.

50 The notches 25, 26, 27, 28 at the four corners of the mounting frame are provided for the insertion of projecting bolts, when the above described square mounting frame is for example to be joined to a rectangular mounting frame having a longer side length.

55 In Fig. 3, adjoining side walls 11' and 13' of two juxtaposed mounting frames are illustrated in section. The pin 15' which is made of a plastics material which is deformable under pressure, is pressed through the hole 20 and forms a durable but detachable fastening between the side walls.

60 In Fig. 4, nine assembled mounting frames 30—38 are illustrated, in which because of the abovedescribed arrangement of the fastening elements a pin always encounters a hole and can be pressed into the latter independently of the selected mutual position of the mounting frames, so that each mounting frame is detachably connected on each side at two points to the adjoining mounting frame.

65 If desired, the pins on the outer sides of the mounting frame can be broken off, in order that projecting pins will not get in the way when it is desired to cover a large area.

If the pieces to be inserted into the mounting frames are easily deformable or elastic and have approximately the same thickness, they can be inserted into the individual mounting frames after the latter have been assembled.

5 If the pieces to be inserted are not flexible or are very thin and if they are intended for mounting frames which are to be fastened on a wall or ceiling, these parts are advantageously cut to a size which is slightly larger than the free area enclosed by the mounting frame and then inserted from the side through the slot 23 into the mounting frame. It is then also possible for additional underlays to be pushed through this slot into the space between the inserted covering piece and the base plate, in order to raise the inserted piece in the mounting frame and to fill the entire depth of the latter. 70

10 Fig. 5 illustrates four mounting frames 50, 51, 52 and 53 of a surface covering. The mounting frame 50 (and every other mounting frame) contains a baseplate 54 and four side walls, of which only the side walls 55, 56, and 57 can be seen in the figure. In contrast to the form of construction illustrated in Figs. 1, 2 and 3, in the case of these mounting frames the device for detachable fastening them together is in the form of a recess 58 disposed in the middle of each side wall. Each of the is formed by a channel in the upper edge inner side of the side wall which extends into the adjoining portion of the base plate. In addition, a projecting pin 59 is provided in the portion of the recess situated in the base plate. The two juxtaposed mounting frames 50 and 51 are joined with the aid of a connecting element 60. The connecting element 60 corresponds in shape to the recesses in the two juxtaposed mounting frames and is inserted into said recesses. In each of its two projections 61 and 62, which are intended for insertion into the portions of the recesses which are situated in the base plate, the connecting element 60 has a bore into which the pins 63 and 64 respectively are inserted in order to hold the connecting element on each of the mounting frames. 90

15 The connection of two juxtaposed mounting frames with the aid of a connecting element is illustrated in Fig. 6, which is a sectional view taken along the line A—A in Fig. 5. The Figure shows the two mounting frames 50' and 51' and the connecting element 60'. As can be seen from the figure, in the region of the recess, the inner side of the side wall (for example of the side wall 56') extends parallel to the outer side, whereby the fitting of the connecting element over the juxtaposed side walls is facilitated. In addition, the pins 63' and 64' projecting upwards out of the portions of the recess which extend in the base plates (for example the base plate 54') can be seen, which are introduced into the bores in the projections 61' and 62', in order to secure the connecting element more satisfactorily. 105

20 The above described connecting element enables any desired number of mounting frames to be detachably secured together rapidly and securely over any surface. Since the shape of

25 the connecting elements matches the recesses in the mounting frames, the insertion space of each of the mounting frames is bounded by continuous smooth interior walls, which is important for the insertion of pieces simply cut to shape. 110

30 In order to ensure that the outer side walls of surface coverings composed of a plurality of mounting frames will not have uncovered recesses, these recesses can be covered by half a connecting element, formed by dividing an element into two parts along the broken line 65 shown in Fig. 6. 115

35 In Fig. 7 an edge piece 70 is shown, which is advantageously used as a side termination of surface coverings, where a bevelled transition is desired between the surface to be covered and the surface covering, as is the case particularly with floor coverings. The edge piece has a portion 71 which has a wedge-shaped section and which is at least as long as a side wall of a mounting frame. The edge piece also has a fastening element 60' which is disposed in the longitudinal centre of the wedge-shaped portion, its shape corresponding to a fastening element 60 symmetrically divided in its transverse direction, i.e. longitudinally of the side wall. 120

40 It is obvious that the above described form of construction of the mounting frame can also be modified so that more than one recess for the insertion of connecting elements is provided along each side wall. 125

45 In the form of construction of a mounting frame which is illustrated in Fig. 8, the recesses are in the form of notches 75, 76. These notches extend along the joint between the base plate 77 or 78 and the inner surfaces of the side wall 79 or 80 respectively. A clip 81 which is made of elastic material and which embraces the two side walls is used as connecting element. 130

50 In the embodiment illustrated in Fig. 9, the mounting frame has recesses 83, 84, and 85 in the form of blind holes. These blind holes are disposed at regular intervals along the edge between the base plate 86 and the inner surface of the side wall 87. In this embodiment juxtaposed mounting frames are held together with the aid of springs 88, 89, and 90 engaging in the blind holes. It is naturally also possible for the blind holes to be replaced by continuous bores and for a spirally wound connecting element to be used instead of the spring clips. 135

55 Another form of construction of mounting frames is illustrated in Fig. 10, in which the recesses 91 and 92 practically correspond to the recesses 75 and 76 shown in Fig. 8. In contrast to the embodiment illustrated in Fig. 8, the mounting frames shown in Fig. 10 are connected together by a connecting element in the form of a section bar 93. This section bar has a T-shaped cross-section, while the outer ends of the cross-beam have extensions 95 and 96 respectively which lead to the base plate 140

of the mounting frames and which have at their bottom inner ends projecting flanges 97, 98 which engage in the recesses 91 and 92 respectively. The individual mounting frames 5 are separated from one another by the vertical centre web 98 of the T-shaped section bar, which is advantageous for certain purposes, and the flat cross-beam 94 of the section bar permits smooth termination of the side walls 10 of the mounting frames assembled together to form a surface covering, fitting, the pieces of material inserted in the mounting frames.

In the embodiment illustrated in Fig. 11, the recesses are in the form of channels 100, 15 101 open on one side and extending on the outside of the side walls of the mounting frames, approximately halfway up their height and running in the longitudinal direction. The connecting element 102 fitting said channels 20 is T-shaped and on its vertical central web is provided with two beads of approximately circular cross-section.

In the embodiment illustrated in Fig. 12, two identical mounting frames 105 and 106, the shape of which corresponds to the mounting frames as already described with reference to Fig. 10, are joined by a fastening element 107 which itself is in the form of a mounting frame. The fastening element contains a base 25 plate 108 and side walls 109, 110, which are pushed over the corresponding side walls 111 and 112 respectively of the two mounting frames 105 and 106 and fastened with the aid of the beads 113, 114 in corresponding recesses 30 115 and 116 respectively. It is obvious that the most important dimensions of this fastening element may be so selected that the latter can be inserted instead of a mounting frame 35 between four mounting frames abutting by 40 their outer edges.

The mounting frames are preferably made of plastics material, such as polystyrene, polypropylene, nylon, polyethylene, or of plastics materials reinforced with glass fibres or other 45 materials, or of rubber, wood, metal or glass. They may be flexible, semi-stiff, or non-elastic. Instead of the above described pins, the fastening elements used may comprise a threaded bolt and the side walls may be provided with 50 an open ended bore adapted to receive the bolt, which is practical or even necessary particularly when the mounting frame is made of a non-elastic material, or when it is not possible to make the mounting frame and the fastening elements in one piece. Finally, the 55 base plate may also be provided with one or more holes if the mounting frames are not laid horizontally but are to be fastened on a wall or ceiling without the use of rails or adhesive plastics. Instead of roughening the underside 60 of the base plate by scoring, the underside may also have a non-slip layer applied or adhesively bonded to it. The shape of the mounting frames is also not restricted to the above described square shape, and any shapes which

can be assembled to form larger areas may be used, such as triangles, rectangles, parallelograms, hexagons, and shapes derived therefrom by rectilinear parts. The possibilities of assembly are not limited to identical shapes, but different shapes may also be assembled, provided that dimensions adjusted to one another are used for all shapes and that the distance between the fastening elements are always the same.

Thus, particularly when using mounting frames of different shapes, it is possible to produce coverings for large surfaces in any desired pattern, which are secured against mutual displacement but can be changed or removed at any time. Moreover, the edges of the individual parts of the covering which are to be inserted are thereby effectively protected against wear, and parts of different thickness can be raised by the use of compensating pieces inserted between the inserted parts and the bottom plate of the mounting frames, in order to form a large flat surface, and finally through the fastening of individual mounting frames together, the non-slip surface on the underside of the mounting frames can prevent the displacement of the covering, particularly in the case of floor coverings.

WHAT WE CLAIM IS:—

1. A mounting frame for carpet tiles, comprising a base plate, rectilinear side walls having greater internal depth than the thickness of the base plate and framing the base plate to define therewith a carpet receiving space, fastening means associated with each side wall adapted to detachably fasten that side wall to an adjoining side wall of a juxtaposed mounting frame, and retaining means arranged to retain a carpet tile in the carpet receiving space. 95
2. A frame as claimed in claim 1, wherein the base plate and the side walls are made in one piece. 100
3. A frame as claimed in claim 1 or 2, wherein the frame is made of plastics material. 110
4. A frame as claimed in claim 1, wherein the retaining means comprise portions of the side walls projecting laterally over the carpet receiving space. 115
5. A frame as claimed in any one of claims 1 to 4, wherein each side wall is formed with a socket and the fastening means comprises a pin integral with said side wall, the pins and sockets being so arranged that adjacent sides walls of juxtaposed mounting frames may be 120 detachably fastened together by at least two pin and socket connections. 120
6. A frame as claimed in claim 5, wherein pins and sockets are alternately disposed around the periphery of the frame. 125
7. A frame as claimed in any one of claims 1 to 4, wherein each side wall is adapted to receive a bolt comprising the fastening means, whereby adjacent side walls of juxtaposed mounting frames may be detachably fastened 130

together by at least two bolted connections.

8. A frame as claimed in claim 6, wherein bolt receiving apertures and threaded sockets are alternatively disposed around the periphery of the frame.

9. A frame as claimed in any one of the preceding claims, wherein the inner sides of the side walls are inclined in such a manner that the upper surface of the base plate enclosed by the side walls is larger in area than the area enclosed by the top edges of the side walls.

10. A frame as claimed in any one of claims 1 to 4, wherein the fastening means for detachable fastening comprises at least one fastening element adapted for insertion in an associated recess in its respective side wall.

11. A frame as claimed in claim 10, wherein the recess extends over the upper edge and the inner side of the side wall and into the adjoining base plate.

12. A frame as claimed in claim 11, wherein a projecting pin is provided in the portion of the recess which extends into the base plate for securing the fastening element, the top surface of the projecting pin being flush with the surface of the base plate.

13. A frame as claimed in claim 10, wherein the recess is in the form of a notch extending parallel to the joint between the base plate and the inner side of the side wall.

14. A frame as claimed in claim 10, wherein the recess is in the form of a blind hole.

15. A frame as claimed in claim 10, wherein the recess is in the form of an open ended bore.

16. A frame as claimed in claim 10, wherein the recess is in the form of a notch which is disposed on the outer side of the side wall and extends in the longitudinal direction of the side wall, the inner cross-section of the recess being larger than its outer aperture.

17. A frame as claimed in any one of claims 10 to 16, wherein the retaining means comprise portions of the connecting element adapt-

ed to retain a carpet in the carpet receiving space.

18. A frame as claimed in any one of the preceding claims, wherein the underside of the base plate is provided with an anti-slip surface.

19. A frame as claimed in claim 18, wherein the anti-slip surface comprises a non-slip coating adhering to the underside of the base plate.

20. A frame as claimed in claim 18, wherein the anti-slip surface is provided by roughening the underside of the base plate.

21. A frame as claimed in any one of the preceding claims, wherein at least one of the side walls has, at the height of the upper surface of the base plate and over its entire length, a slot for the insertion of a covering or of an intermediate material to be inserted.

22. A mounting frame for carpet tiles, substantially as described herein with reference to Figs. 4 to 6 of the accompanying drawings.

23. A mounting frame for carpet tiles, substantially as described herein with reference to Figs. 5 to 7 of the accompanying drawings.

24. A mounting frame for carpet tiles, substantially as described herein with reference to Fig. 8 of the accompanying drawings.

25. A mounting frame for carpet tiles, substantially as described herein with reference to Fig. 9 of the accompanying drawings.

26. A mounting frame for carpet tiles, substantially as described herein with reference to Fig. 10 of the accompanying drawings.

27. A mounting frame for carpet tiles, substantially as described herein with reference to Fig. 11 of the accompanying drawings.

28. A mounting frame for carpet tiles, substantially as described herein with reference to Fig. 12 of the accompanying drawings.

29. A surface covering made up of mounting frames as claimed in any one of the preceding claims.

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Sheet 2

Fig. 4

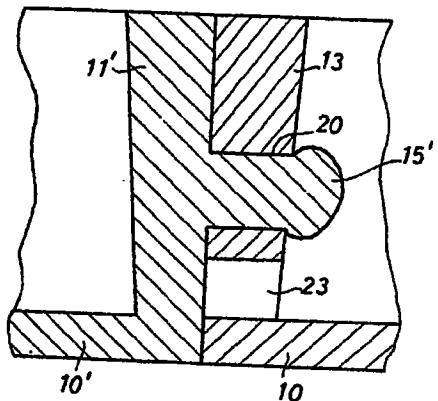
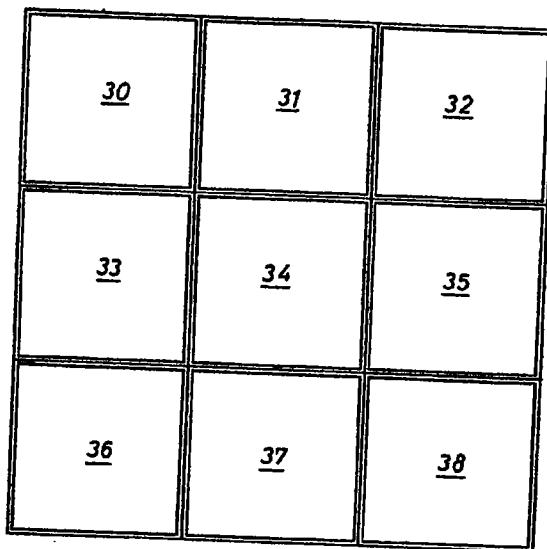


Fig. 3

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Sheet 3

Fig. 5

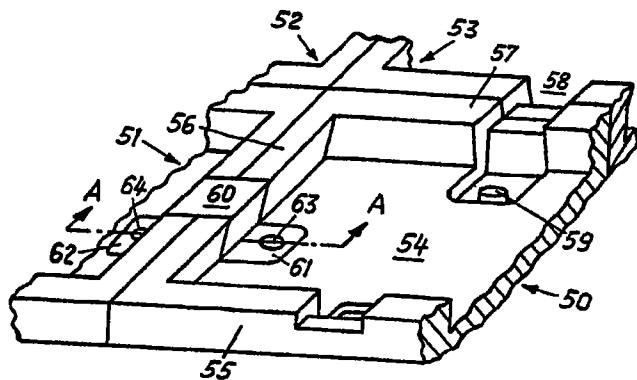


Fig. 6

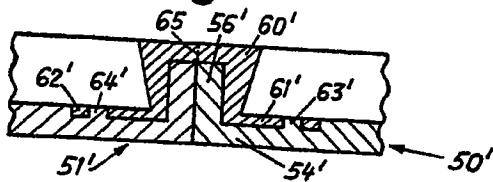
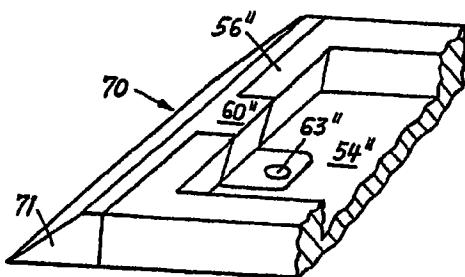


Fig. 7



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Fig. 8

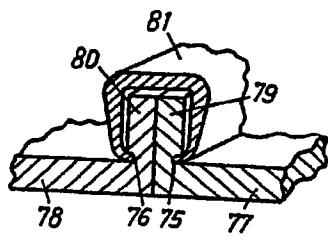


Fig. 9

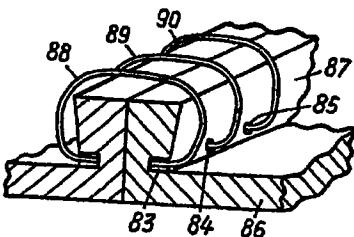


Fig. 10

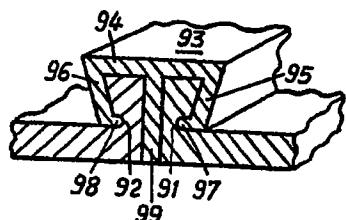


Fig. 11

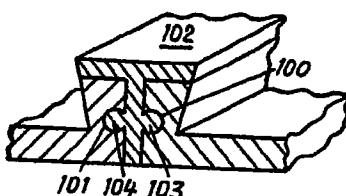


Fig. 12

